A Study on the Effect of Granular Residual in the Banking Network on the Transmission of Monetary Policy through Lending Channel

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Abstract

Granular residual is created in the banking network when there are a few large banks with many small banks. In this case, the effect of the shocks on each bank not lost in total that can lead to macro-economic consequences. The transmission of monetary policy through change in bank facilities is one of the key mechanisms affecting monetary policies.

The power of transmission of monetary policy mechanism is highly dependent on the specific characteristics of the banking network. Thus, the importance of granular residual and considering it on transmission of monetary policy in the banking network is important. The purpose of the present study is the effect of granular residual in Iran's banking network on the transmission of monetary policy through lending channel. Indeed, the granular residual was imported in this study as a independent variable that can effect on bank facilities and lending channel. Therefore, in the present study, the balance sheet data of 32 banks from the banking network for the period 2001-2014 were used. The model used in this study was estimated through the Generalized Method of Moments (GMM). The results showed that in the first, according to available theories in relation to the granular residual and conducting relevant empirical analyses, the presence of granular residual in Iran's banking network is confirmed. Also as expected, granular residual has a positive and significant effect on Iran's banking network facilities and the transmission of monetary policy through lending channel is weakened by increasing the granular impacts.

Keywords: banking granular residual, monetary policy transmission mechanism, bank lending channel, monetary conditions index, Herfindahl-Hirschman Index

Classification JEL: E52, E02, E51, E42

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1. Introduction

Significant studies in the past two decades have investigated the transmission of monetary policy mechanisms to better understand the impacts of monetary policy on the real economy. In general, there are two major perspectives of Keynesian and monetary related to Monetary Transmission Mechanism and duration of its effectiveness. Keynesians, with particular emphasis on the interest rate and the relation between all markets through it consider the transmission of monetary policy effects only through the channel of interest rate. But the monetarists consider the low interest elasticity of money demand and approximate vertical of LM curve believe that monetary policy is effective through another channel rather than the interest rate.

According to the monetarist point of view, increasing the stock of money leads to the increase of total demand and given the delay in the adjustment of wages in the labor market or the lack of flexibility of prices, the level of cost and product increases and if wages are fully moderated, the increase in money stock will only lead to price increase. Thus in general monetarists believe that increasing the money stock leads to increase nominal output and, wages are fully moderated over time, and the increase of the money stock shows itself in rising prices and production turns to its initial level (Branson, 1979). Some of the most important monetary transmission channels include: The traditional interest rate channel, exchange rate channel, channel of stock price, bank lending channel, channel of firms balance sheets and channel of households' balance sheet effects.

Since the ways of funding, such as the capital market and stock in developing countries like Iran are not well developed; the most important external source of financing in companies is banking loans.

Bernanke and Blinder (1988) define bank lending channel as the reduction in the total level of credits granted by banks in response to a monetary policy retraction. However, many factors explain the key role of bank lending in transmission of monetary policy in each country.

Granular residual in the banking network refers to the heterogeneous structure of banking network with its certain statistical properties that only a few banks play a decisive role in the banking network and these banks are able to transfer crisis and shocks to the whole banking network and thus the entire economy. Thus, the present study will review the important factor of existing granular residual in the banking network on bank lending

channel of transmission of monetary policy. The purpose of this article is to answer the following questions:

1. Is there any granular residual in Iran sbanking network?

2. Does granular residual in Iran sbanking network affect lending facilities in the banking network?

3. Is granular residual in Iran sbanking network effective on the transmission of monetary policy mechanism through lending?

Therefore, It sessential that the granular residual effects in Banking network to be regarded in bank lending channel of monetary policy. On one hand This can influence on the results of bank lending channel and on the other hand this can extracted useful and beneficial results.

In the present paper, in the second part of theoretical foundations, the transmission of monetary policy mechanism is provided through bank lending is presented and bank granular residual and then related studies are presented in Section III. The fourth section is devoted to the introduction of data and estimation method. The estimation results are presented in the fifth section. Final section of this study is dedicated to the conclusion.

2. Theoretical Framework

Since banks can solve the problems related to asymmetric information in financial markets, bank lending channel is based on the idea that banks can play a special role in the financial system. In order to fulfill bank lending channel, two conditions are required. First, the number of companies should be dependent on bank loans. Second, the central bank, should be able to change banks' loan supply by using the available tools.

In relation to the first condition, it is evident that most small companies rely on the bank to require finance because small companies are not generally able to acquire the securities market. This effect is especially important for countries with less developed capital market.

In relation to the second condition, a restrictive monetary policy reduces liquidity in the community and the total level of deposits. Due to the fact that deposits are one of the most low- cost sources of financing for banks, it would be costly and even impossible for a number of companies to compensate the lack of deposits by other sources of funding. Thus, a number of banks will not be able to obtain required lending to maintain the level of lending, hence they offer fewer loans. In this case, reducing the supply of loan in the banks that have weak balance sheet (e.g., less

liquidity) compared to the banks that have strong balance sheet is greater (Gonzalez and Grosz, 2007).

In fact, if a part of borrowers depend on bank and banks have no other complete substitute in their balance sheets for bank lending, monetary policy will be effective through bank lending channel (Kakes, 1998).

One of the results of bank lending channel is that monetary policy will be effective on expenditures of smaller companies more than large companies, because smaller companies are more dependent on bank loans, while large companies have a direct access to credit markets through securities and stock markets without the need to banks (Mishkin, 1996).

recently, some famous policy makers and academics professors have proposed limiting the size of banks or breaking large banks to small banks (Bremus & Buch, 2014).

The first time, the concept of granular residual in the economy was raised by Gabaix (2011) and for companies. He demonstrated that shocks on 100 large companies in the United States explain a significant ratio of growth of GDP per capita. Granular impacts can be applied to the banking sector, so that the shocks of large banks will be considered as representatives of large events that impress banking network and hence macroeconomics.

In the companies, a mechanism that is the stimulant of granular impacts is the unequal distribution of the size of company. In this case, the distribution of the size of company is not statistically normal and is usually flattened tail (Bremus et al., 2013).

Despite the granular residual in the banking network, the impact of banking shocks on growth and development depend on the degree of centralization of the banking network. Granular impacts have a direct relationship with the large banks in the banking network. In fact, granular impacts are created when the markets are centralized. Therefore, in addition to the issues related to moral hazards, the large banks only affect the growth of macroeconomics by largeness.

Gabaix (2011) measured granular impacts "residual of granular impacts" with sum of the weights of specific shocks of bank to total assets that weights represent the market share of banks. Thus, the structure of the banking market has significant and perhaps different impacts and may be differ on macroeconomics that makes the study of kind of the banking market structure important. In summary, granular impacts in the banking refer to a special structure of the banking market with features such as:

1. The banking market must be centralized or relatively centralized.
2. The banking market structure must be consisted of a large number of small banks with a few large banks according to their size.
3. Statistically, the distribution of the size of banks in the banking network must not be normal and distribution must be flattened tail.

Boyd and Gertler (1993) referred to the subprime real estate loans with no support by large banks as the primary source of United States of America banking crisis in the 1980s and then the fragility of broad economic credit after it. Expectation of financial assistance leads to unwise risk of large banks. In other words, too largeness leads to close relationships between large banks and financial institutions with a high debt load may damage the stability of the entire financial system.

Tarashev et al (2010, 2009) showed that large banks have an important systemic role. Gandhi and Lustig (2013) proved that banks, investors and borrowers are subject to particular substantial risks that are related to the banking crisis and failures.

In the present study, the shocks on large banks through monetary policy on banking network that its final effect on the economy is followed through its effects on lending and the transmission of monetary policy.

3. Review of literature

Ganji and Yuan (2010) showed that the effect of monetary policy on lending is weaker for the banks with lower liquidity and larger banks. Also, profitable banks have low sensitivity to monetary policy.

Olivero & Jeon (2010) showed that the increase of competition in the banking industry weakens the transmission of monetary policy mechanism through bank lending channel.

Hou and Wang (2013) tested banking market effect on the transmission of monetary policy mechanism by bank lending channel and examined the relationship between banking market and the transmission of monetary policy mechanism among heterogeneous banks. The results showed that when the banking market rises, the transmission of monetary policy mechanism is weakened through bank lending channel, it is especially effective for large banks with high profitability and high capitalization.

The importance of granular impacts is shown in international trade (Di Giovanni & Levchenko, 2009), macroeconomic fluctuations in the USA (Gabaix, 2011) and the domestic banking markets (Bremus et al., 2013).

Blank et al (2009) demonstrated that the shocks on large banks affect the probability of bankruptcy of small banks in Germany.

Bush and Neugebauer (2011) showed that granular in the banking network in Eastern Europe has a considerable importance in the explanation of the short term output fluctuations.

Bremus et al (2013) stated that, in terms of empirical, the distribution of size in banking is similar to fat tail power law distribution that is required to create granular impacts. Financial openness affects market structure in the banking markets.

De Blas & Russ (2013), focused on modeling financial openness with foreign direct investment of banks and foreign lending and also by considering the heterogeneous banks. The two types of financial openness have different effects on Herfindahl index of the banking sector. Foreign lending to domestic banks causes a competitive pressure and market shares will be also more similar to each other and the centralization decreases.

Bremus et al., (2013) showed that the reaction of banks to most shocks depends on markup rather than changing lending rates in case of increasing competition. Thus, the transfer of banking shocks to the real economy will be weakened. This reduces the granular impacts. Foreign direct investment bank increases or decreases the centralization. If the most efficient foreign banks are integrated with the most efficient internal banks and if the smallest banks leave the market, large banks will be larger and this increases the centralization. As a result, the relationship between the bank shocks and the consequences of macroeconomics will be strengthened by increasing the centralization. But foreign direct investment of bank also reduces the centralization. If market shares of banks are more similar to each other, different channels of financial openness will have different effects on the stability of granular.

Bremus and Bush (2014) also showed that in more than 80 countries, shocks on large banks led to macroeconomic fluctuations that in relation to the importance of this issue, to the great crisis of banking of United States of America can be mentioned.

It s so clear that the main innovation of this study is related to import the granular residual variable in banking on the bank lending channel model. Of course, for this purpose, It s should be showed and extracted the existence of granular residual variable in Iran banking at first network that this is another innovation of this study.

4. Research Methodology

First, granular impacts in the banking sector are estimated as granular residual. Banking granular residual (BGR) is obtained by multiplied specific shocks in the market share of each bank and collecting in all the banks:

$$BGR_{it} = \sum_{j=1}^{N} Asset\ Shock_{j,t} \frac{Assets_{j,t}}{Assets_{i,t}} \qquad (1)$$

So that $Assets_{j,t}$ shows total assets of bank j in time t. While $Assets_{i,t}$ is total assets of the banking network in year t. To calculate the assets shock, the average growth rate of total assets size in the banking network will be subtracted from the growth rate of assets size in bank i (Bremus and Bush, 2014).

4.1. introducing other variables

A necessary condition for the existence of bank lending channel is that after applying restrictive monetary policy all bank deposits and bank loans will be reduced. But there is this possibility that reducing the growth of loan due to reducing demand is due to higher levels of interest rates. To distinguish between the effects of the supply of loan demand, the identification method of Kashyap and Stein (1995) can be useful. Their main idea is that the cross differences of reaction of bank loans to monetary policy shock reflects the bank lending channel. In other words, by controlling the possible differences in the loan demand, the remaining difference in lending behavior between banks should be due to supply stimulations. So that that these differences are related to indices of the information asymmetry between banks and their borrowers (such as size, liquidity or capital saving) and finally, this supports the idea of bank lending channel (Hernando and Pagez, 2001).

In this study, to control and separate the supply from loan demand, the similar variables of some studies on the bank lending channel like Kashyap and Stein (2000), Ganji and Yuan (2010) and Bhaumik et al (2011) were used. But the contribution of this study as was already titled in entering granular residual to bank lending channel literature is another effective factor.

According to the subject literature, there are three variables that are widely used to measure the bank characteristics which are the size of bank, liquidity and capital. According to studies conducted by Kashyap and

Stein (2000), Ganji and Yuan (2010) and Bhaumik et al (2011), change in loans granted by the bank i is a function of the following variables:

$$
\begin{aligned}
\Delta \ln(\text{loan}_{it}) = \ & \beta_0 + \beta_1 \text{loan}_{i,t-1} \\
& + \beta_2 \text{size}_{i,t-1} \\
& + \beta_3 \text{liquidity}_{i,t-1} \\
& + \beta_4 \text{Capital}_{i,t-1} \\
& + \beta_5 \text{gdpgrowth}_t \\
& + \beta_6 \text{cpigrowth}_t + \beta_7 \Delta \text{MP}_{t-1} \\
& + \beta_8 \text{hhi}_t + \beta_9 \text{BGR}_{i,t} \\
& + \beta_{10} \text{BGR}_{i,t} . \Delta \text{MP}_{t-1} + \varepsilon_{it}
\end{aligned}
\tag{2}
$$

So that t is time, $_{it}$ is disturbing component with an average of zero. Like Hou and Wang (2013), GMM or panel estimation method can be used for estimate. Template variables are defined as follows:

$\Delta \textbf{MP}_t$: change in the instrument of monetary policy (MP) that in this study, monetary conditions index (MCI) is used. Interest rate and exchange rate are two important channels of transferring money that through monetary policy affects economic activity and inflation. Of combination of interest rate and the exchange rate could be used to show monetary conditions, which is called traditional monetary conditions. MCI is designed to show conditions (degree of closeness or openness of economic) of monetary policy in a given period. In developing countries, the financial system is in such a way that interest rate is not determined on the market as transparent and does not have the necessary functions. In this case, total demand is more under the influence of credits amount not their prices (Bayangos, 2000). In this study, for achieving the main purpose, monetary conditions index extended for Iran and period of 2012-1978, according to available data and by using Autoregressive- Distributed Lag (ARDL) was estimated and its results have been used in estimating the model. It is essential to note that the monetary conditions index itself does not have a concept, but it is change in this index that indicates monetary conditions expansion or contraction. Thus, the first difference MCI was used in the above regression.

$\Delta \textbf{ln}(\textbf{loan}_{it})$: It is the logarithmic difference of total loans. Logarithmic difference of total loans roughly is equal to the growth rate of bank lending. According to Bhaumik et al (2011), a reasonable assumption is considered that change in monetary policy in a particular year affects bank

lending with a lag in the next year. So that $\Delta \ln(\text{loan}_{it})$ is a function of the change with lag in monetary policy instrument i.e. ΔMP_{t-1}.

$\text{size}_{i,t-1}$: In this paper, as Olivero et al (2010), a relative measure of the size of banks is used as follows:

$$size_{it} = \ln(assets_{it}) - \sum_{i=1}^{n_t} \ln(assets_{it}) / n_t \quad (3)$$

n_t indicates the number of banks at time t.

$\text{liquidity}_{i,t-1}$: lagged liquidity that is calculated through the following index:

$$\text{Liq}_{it} = \frac{L_{it}}{A_{it}} \circ \left(\sum_t \frac{\sum_i L_{it}/A_{it}}{N_t} \right) / T \quad (4)$$

The formula measures the liquid of bank L_{it} to total assets A_{it} that this criterion is normalized according to its mean among all the banks in the related sample.

$\text{Capital}_{i,t-1}$: capitalization with lag that is calculated from the following index:

$$\text{Cap}_{it} = \frac{C_{it}}{A_{it}} \circ \left(\sum_t \frac{\sum_i C_{it}/A_{it}}{N_t} \right) / T \quad (5)$$

This formula measures capital C_{it} to total assets A_{it} that this criterion is normalized according to its mean among all the banks in the related sample. In this paper, the interval values of size, liquidity and capitalization of bank are used to reduce the potential among loan growth and features of bank.

gdpgrowth_t: GDP growth rate variable that is used to control the demand for loan.

cpigrowth_t: Variable of growth rate of loan that is used to control the loan demand.

hhi_t: Herfindahl-Hirschman Index, as studies that consider bank lending behavior affected by the structure of the banking market (Olivero et al., 2010), In this paper, it is also entered the model.

Statistics used in this study were extracted from Iranian banks' balance sheets statistical website of Central Bank of the Islamic Republic of Iran and also Bankscope.

4.2. The introduction of the research method

According to Arellano and Bond (1991) in this paper, the two-stage Generalized Method of Moments GMM was used for to dynamic panel data estimation. In order to determine the validity of the matrix of tools, Sargan test is used. In this test, the null hypothesis test indicates the non-correlation of tools with disturbing elements or appropriateness of tools.

4.3. The study of the presence of granular in the banking network in Iran

At this section and foremost, the presence of granular in Iran's banking network in the years 2001 to 2014 is investigated. Similar to Blank et al (2009), Herfindahl-Hirschman index is used to measure the degree of centralization of the banking market in Iran (Blank et al., 2009).

4.3.1. The introduction of Herfindahl-Hirschman index

Bikker and Haaf (2000) defined Herfindahl-Hirschman index as the sum of the squares of the size of banks that is used to measure the market shares. This index can be calculated for total assets, deposits and loans. Often it is called index with full information (Bikker & Haff, 2000). The table below shows the different values of this index and kind of decision making proportional to any size according to the US merger guidelines:

Table 1: The different lags of Herfindahl-Hirschman index

Size of index HHI	Conclusion
HHI<0.01	A highly competitive market
HHI<0.1	Unconcentrated market
0.1ے HHI<1.8	moderately concentrated market
HHLع1.8	A highly concentrated market

Resource: Titilayo & Victor (2014)

In the table below, the values of this index have been calculated for the total assets, deposits and Iran's banking network lending from 2001 to 2014 and for 32 banks from the country's banking network. As the results show, according to the index in each three markets, almost in most of interval years studied of banking network has had soft focus. So the banking network in the years 2001 to 2014 has had a relatively focused market. Blanch et al (2009) found similar results for Germany. But as Blank et al (2009) also pointed out, despite the relatively low degree of concentration in the German banking by standard measures such as HHI can affect banking system due to the nature of banking, especial shocks in the largest banks.

Table 2: The Herfindahl Hirschman index in the market of assets, deposits and Iran's banking network lending

Year HHI	2001	2002	2003	2004	2005	2006	2007
Assets	0.154	0.153	0.146	0.140	0.124	0.116	0.131
Deposits	0.182	0.170	0.160	0.158	0.164	0.141	0.101
Lending	0.169	0.144	0.135	0.126	0.115	0.105	0.102
Year HHI	2008	2009	2010	2011	2012	2013	2014
Assets	0.105	0.111	0.091	0.082	0.080	0.069	0.068
Deposits	0.115	0.113	0.097	0.096	0.084	0.078	0.076
Lending	0.098	0.090	0.173	0.095	0.093	0.078	0.074

Resource: Estimate Calculations

4.3.2. Descriptive statistics

The statistical characteristics of size of banks are presented in the table below. These results were obtained by using software Eviews9.

Table 3: statistical characteristics of size of banks

Mean	Medium	Skewness	Kurtosis	Jarque-Bera	The probility of Jarque-Bera
153578.1	82398.39	1.398378	3.939526	11.60606	0.003018

Resource: Estimate Calculations

It is observed that skewness is positive and kurtosis indicates that data distribution is longer than a normal distribution. Jarque-Bra test rejects the assumption of normal distribution of the size of banks. Thus, according to what was found, the presence of granular for Iran s banking system can be confirmed.

4.4. Stationary test of the model's variables

According to the results of the tests, it was shown in Table 4 that all variables are in the level of stationary.

Table 4: The results of collective unit root test of variables affecting bank lending channel

Variables	ADF-Fisher Chi-square		Im, Pesaran and Shin W-stat		Levin,Lin& Chu		Result
	prob	Statistic	Prob	Statistic	Prob	Statistic	
$Ln(loan_{it})$	0.00	130.89	0.00	-4.93	0.00	-12.39	I(0)
BGR_{it}	0.00	129.23	0.00	-7.60	0.00	-9.55	I(0)
MCI_t	0.00	205.43	---	---	0.00	-12.71	I(0)
$GDPgrowth_t$	0.00	196.66	0.00	-8.96	0.00	-17.20	I(0)
$CPIgrowth_t$	0.00	115.69	0.00	-4.61	0.00	-6.31	I(0)
$SIZE_{it}$	0.00	176.80	---	---	0.00	-20.36	I(0)
$Liquidity_{it}$	0.00	137.44	0.00	011.87	0.00	-74.45	I(0)
$Capital_{it}$	0.00	155.49	0.00	-14.10	0.00	-35.63	I(0)
HHI_t	0.00	136.06	0.00	-6.17	0.00	-10.78	I(0)

Resource: Estimate Calculations

4.5. Model estimation and results interpretation

In Table 5, the results of the model estimate are presented. As the results show that all the variables affecting the bank lending channel, except the variable of lagged liquidity are significant. Also in this estimate, to assess the validity of the tools matrix, Sargan test was used. In this test, the null hypothesis is an indicative of the lack of correlation of tools with disturbing elements. Due to the possibility of Sargan test statistic in the table, it can be considered that the null hypothesis based on the lack of correlation of tools with disturbing elements cannot be rejected. Thus, it can be concluded that the tools used for the estimate have the necessary validity.

Table 5: The estimation results by GMM model

Variable	Coefficient	Prob	T-statistic
$\Delta(loan_{i,t-1})$	0.06	0.00	5.71
$size_{i,t-1}$	-0.102	0.00	-5.11
$liquidity_{i,t-1}$	-0.06	0.30	-1.03
$Capital_{i,t-1}$	0.41	0.00	8.89
$gdpgrowth_t$	1.09	0.00	20.69
$cpigrowth_t$	-0.01	0.00	-9.50
ΔMP_{t-1}	-1.75e- 0.5	0.00	-3.73
hhi_t	-0.87	0.05	-1.92
$BGR_{i,t}$	0.46	0.00	3.14
$BGR_{i,t}.\Delta MP_{t-1}$	0.0003	0.07	1.76
Sargan test=0.30	J-statistic=16.21	Instrument rank=24	

Resource: Estimate Calculations

As the results of the model estimate show, the mark of all variables is as expected. The only mark of lagged size in the period under review is not as expected and has a significant and inverse effect on the banking network lending. The negative coefficient of lagged variables on Iran's banking network lending during the period under review means that the banks that were larger and had more assets have had less willing to grant loans and earn money through lending.

According to the results, the lagged variable of monetary policy index, namely the monetary conditions index has a significant inverse effect on Iran's banking network lending. Increasing the monetary conditions index means a restrictive monetary policy. Applying restrictive monetary policy increases interest rate which leads to a decrease in bank deposits. However, the bank can keep the asset of its balance sheet unchanged only if increases other sources of funding accordingly. But the interest rate and costs that a bank has to pay for such funds have reduced with restrictive monetary policy has increased. Banks at least transfer a part of this higher cost to the rate of their loans. Thus, it is expect that monetary policy variable reacts negatively to bank lending.

According to the results obtained, Herfindahl-Hirschman index variable or centralization index has a significant inverse effect on Iran's banking network lending. In other words, it can be said that the supply of loan in the centralized banking market is done less. While the increase of centralization in the banking network weakens the transmission of monetary policy mechanism.

According to the estimation results of the model, as expected bank granular residual variable or BGR has a positive and significant effect on Iran's banking network lending. According to the definition of bank granular residual variable banking, increasing the variable means positive shock to large banks in the banking network. According to the existing literature on the bank granular residual variable, the positive shock to the large banks affects the entire banking system and the whole banking network and macroeconomics will be influenced by the positive effects of these shocks which lead to an increase in lending of the banking network and ultimately will lead to macroeconomics impacts, the positive economic growth. But the same issue exists about the reduction of bank granular residual variable in the opposite direction. This means that when this variable is reduced, a negative shock is happened to large banks in the banking network, which, by definition, the variable in accordance with the

existing literature, will make the entire banking network face the crisis. Finally, the crisis in the banking network and spread negative shock to the entire banking network will cause to reduced lending in the banking network and the subsequent contagion of crisis to the economy of the country and then reduced economic growth.

Finally the last and yet the most important variable that is interpreted is the variable of simultaneous effect of granular residual and monetary policy index on lending banking network. As it can be seen, the variable has a positive and significant effect on Iran's banking network lending. In fact, the increase of granular residual variable and at the same time implementing restrictive monetary policy will lead to increase lending of banking network. This result is also consistent with the theory. In fact, the increase of granular residual variable which means the positive shock to large banks in banking network and thus to the entire banking network causes to be reduced the negative effects resulting from applying restrictive monetary policy on banking network lending and eventually banking network lending increases. So, in fact, increase granular residual will lead to weaken transmission of monetary policy mechanism through bank lending channel.

5. Conclusions

Due to the significant effects of the granular impacts on macroeconomics, in this paper, the granular impacts in banking on the transmission of monetary policy mechanism through lending channel and ultimately on the microeconomic was investigated. For this purpose, first granular residual in Iran's banking network was proved and considering special statistic characteristics related to granular residual and conduction empirical tests, this result obtained during the years 2001-2014 in Iran's banking network, there was granular impacts.

The present study attempted to make the sample be as comprehensive as possible. For this purpose, the latest available data of bank and almost information of all banks and credit institutions, i.e. 32 banks, were used. Then, for testing the main purpose of the study, the unit root test was performed for all variables and the result was that all variables in the model are stationary. Finally, the original model of the study was estimated by using the generalized method of moments.

In the present study, the variable of monetary conditions index was used to determine the expansion and contraction of the applied policies.

The estimation results of model showed that the bank granular residual variable has a significant positive effect on Iran's banking network lending and the bank granular residual variable weakens the transmission of monetary policy mechanism through the bank lending channel.

The estimation results of model are in line with expectations and theory about granular impacts. According to the results of model estimation, It is suggested that government and the Central Bank pay enough attention to granular impacts in the banking network and thus to the structure of the banking network. Because the presence of granular impacts in the banking network according to the definition will cause a shock to great granular banks in the banking network and spread to the entire banking network and lead to the crisis in the banking network, as well as in macroeconomics. In fact, in this case, great granular banks in the banking network will decide for the entire banking network.

As seen in this study, the effects of monetary policy also depend on the presence of bank granular residual. So that these effects in the banking network can lead to effects and results over the governments estimates from applying policies and fail the government and the central bank in achieving the predetermined goals.

In attention to the results of the study, It is recommended to policymakers that adopt policies which resulted increase in private banks and therefore total banks in the banking network. It decreases the granularity in banking network. Decrease the granularity in banking network lead to expected policy results.

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